

REVIEW OF THE LIBRARIES AUSTRALIA DOCUMENT DELIVERY SERVICE AND THE ISO ILL PROTOCOL

DISCUSSION PAPER FOR LIBRARIES AUSTRALIA ISO ILL PARTNERS MEETING

Introduction

Libraries Australia Document Delivery (LADD) is a web-based service supporting interlibrary lending and document delivery (ILL) between Australian libraries. It uses the Online Computer Library Centre's (OCLC) Virtual Document eXchange (VDX) software. VDX supports interconnection with other ILL systems using the International Organization for Standardization *Open Systems Interconnection - Interlibrary Loan Application Protocol* (ISO ILL).

This paper reports the findings of a review of the options for the continuing operation and development of LADD, including the strategic direction of the VDX software and the future of the ISO ILL protocol. The review was a key activity under Strategy 1.1 of the *Resource Sharing and Innovation Division Strategic Plan July 2010 to June 2012*.

The information regarding interlibrary lending systems and standards included in the report was gathered from a number of publicly available sources, primarily from the websites of system vendors as well as articles published by ILL practitioners and system vendors. In addition the NLA conducted two surveys, one directed at LADD users and the other at users of ISO ILL systems interoperating with LADD, to gain a better understanding of the ILL environment in which Australian libraries operate. A questionnaire was also sent to selected system vendors, especially those with ISO ILL standard-compliant systems.

Background

LADD enables users to:

- search the [ANBD](#), [Te Puna](#) and [Infotrieve](#) to locate items
- receive and process requests created in the Libraries Australia Search service using the Enhanced Requesting functionality
- transmit and receive ILL requests
- transmit and receive electronic documents using the DocStore functionality
- manage the entire request and supply process
- track activity using built-in reporting facilities
- manage ILL related financial transactions via the LADD Payments Service
- facilitate free interlibrary lending between reciprocal partners
- interoperate with other standards-compliant interlibrary loan systems
- order online from commercial suppliers.

LADD is provided as part of the Libraries Australia subscription at no extra charge. As at June 2011 736 libraries were using LADD. Of these, 635 use the LADD web interface and 101 use ISO ILL compliant systems to interoperate with the LADD service.

Trends in Interlibrary Lending

In 2010, editor of *Interlending and Document Supply* Mike McGrath stated that document supply is declining globally. While this holds true for many countries there are some exceptions such as the United States of America

There are numerous reasons given for this decline. The most frequent are:

- introduction and widespread use of the internet, and
- availability of online journals and e-resources.

ILL activity in Australia increased from the 1960s until the 1990s from which time declines have been reported across library sectors. However, with the exception of 2002/03 and 2004/05, LADD activity grew steadily with increases in the decade to 2009/10 averaging 4% per year. In 2010/2011 LADD supported 295,840 ILL requests, a decrease of 8% (25,160 requests) compared with 2009/2010. University libraries accounted for 91% of the decline even though they account for only 56% of all LADD requests. Both copy and loan requests decreased. Usage of LADD decreased for 57% of libraries but increased for 41%. While usage by most university libraries decreased it increased for 13 universities. Given these observations it is possible that the observed decline is not indicative of an underlying trend or that the trend is largely confined to the university sector. Libraries Australia will continue to monitor LADD statistics to determine if indeed this is the beginning of a longer term trend.

Factors that assisted in maintaining usage of LADD include:

- growth in the number of libraries using the service;
- wider exposure of ANBD holdings through ingest into OCLC's WorldCat;
- continued growth in the LADD user base, and
- wider exposure of library resources through NLA's Trove service.

LADD users responding to the survey listed a number of trends and factors that they expect will influence ILL in the next five years. These are listed at Appendix 1.

In addition to general ILL trends, specific factors that may have contributed to the recent decline in LADD activity include:

- Some larger libraries sending requests direct to commercial document suppliers;
- LADD members implementing consortial ISO ILL systems whereby requests are sent between consortium members and only reach LADD if the request cannot be filled by a member of the consortium. Consortial systems provide economies of scale and are often based on existing library or ILL consortia. Consortia that operate ISO ILL systems that interoperate with the LADD gateway are:
 - Eastern Australia Group of University Libraries (EAGUL)
 - Library Link Victoria

- Queensland Health
- Western Australia Group of University Libraries (WAGUL)
- UNILINC.

In July Infotrieve closed their Australian office and began supporting Australian libraries from their U.S. headquarters. At the same time they significantly increased their charges. This together with the recent increases in ILRS code recommended fees may contribute to a further decrease in LADD requests.

Despite the 2010/11 decline in use and the global downwards trend in ILL LADD has strong and continuing support from its current users. 88% of survey respondents expect to continue using LADD for the next five years; 10% were not sure, while only two percent said that they expect to stop using LADD in the next five years. 55% of survey respondents reported that they use LADD for at least 80% of their ILL requests.

52% of Libraries Australia members (as at June 2011) are not users of LADD. Many of these are small special libraries. Libraries Australia will investigate whether there are opportunities for LADD to support ILL for these libraries or whether their needs are already being met by other services.

Survey respondents suggested a number of enhancements that could be made to LADD (See Appendix 2). They also suggested that the NLA should investigate the feasibility of supporting ILL requests from LADD to: WorldCat Resource Sharing, British Library Document Supply Centre (BLDSC), U.S. National Library of Medicine, U.S. National Library of Agriculture and Subito (a German document supply service).

The NLA has recently negotiated an agreement with the BLSDC to allow Australian libraries to send requests via LADD.

The ISO ILL Protocol

The ISO ILL protocol was developed to enable the exchange of messages between different ILL systems. The protocol was approved as an international standard by the International Organization for Standardization (ISO) in 1991 and was first published in 1993, with a second edition published in 1997. The ISO ILL protocol is broad in scope, defining the entire ILL process, as well as supporting a high level of configuration. This broad scope and flexibility can create difficulties for implementers. With the exception of Australia, New Zealand, and some consortia in the U.S.A. implementation of the protocol has been limited.

At least 14 ILL systems support the ISO ILL protocol although not all of these are used in Australia. See Appendix 3 for details of the standards compliance of ILL systems. Each system vendor has interpreted and implemented the protocol a little differently, resulting in issues when different ISO ILL systems interoperate via the LADD gateway. System vendors also have processes whereby their users are able to request changes to the functionality of the system. While such enhancements are put forward to improve workflows and ILL

processes, not all enhancements interoperate successfully with other ISO ILL systems. The complexity of the standard and the differences in its implementation contribute to the significant overhead in supporting interoperability with LADD.

The future of the ISO ILL protocol is not clear. In 2004, the ISO Technical Committee 46 Standards Committee 4 met to review the ISO ILL protocol. Following this meeting the revised ISO ILL protocol did not advance to the next stage (a vote on a Final Draft International Standard), due to the comments included in the negative votes from three countries (Japan, USA and Australia). These countries voted against the revised standard because it was not backwards compatible. In 2007, version 2 of the ISO ILL protocol was circulated as part of a five year review with a vote taken to retain the standards without any amendments. Since this vote in 2007 no further work has been undertaken on the protocol. There were a number of changes that did not go forward during the 2007 review process. These were practical and minor issues that affect the usability of the standard and could be revisited during the 2013 review process.

The international Rethinking Resource Sharing Initiative's Interoperability Working Group (RRSIWG) has recently begun an investigation into the future of the ISO ILL protocol¹. As part of this investigation it will investigate what, if any, alternatives to the ISO ILL protocol exist and if there is a need for a different standard. At a recent RRSIWG meeting, OCLC and Relais both said that they want to work with the RRSIWG to scope the requirements for the replacement of the protocol. The possibility of using the NCIP message pair model as the basis of a replacement was mentioned at the meeting. The RRSIWG will survey ISO ILL users to obtain their input into the requirement scoping process.

The NLA and the Australian library community have invested heavily in the implementation of the ISO ILL protocol. In addition to the 101 libraries currently using the ISO ILL protocol to interoperate with the LADD service and each other, there are a further 26 ISO ILL libraries that are testing with the LADD system. Seven survey respondents indicated that they plan to implement ISO ILL systems in the next five years while a further 60 said that they were not sure. In 2010/2011, 74% of LADD requests were to/from, or between, ISO ILL sites.

Libraries Australia's operation of the LADD gateway significantly benefits libraries using ISO ILL systems. ISO ILL sites test interoperability with Libraries Australia thereby removing the need to undertake interoperability testing directly with other ISO ILL sites. Maintaining interoperability between ISO ILL sites and the LADD gateway is complex and resource intensive, and has increased dramatically, as the number of ISO ILL sites interoperating has grown from 12 in 2003 to 101 in June 2011. In addition to the one-off 'start-up' tasks to support libraries as they move to ISO ILL systems, a number of maintenance tasks are also required. This means that the total resource required to support interoperability increases with each additional ISO ILL library. Resources are required for the following tasks (some of which are performed outside regular hours):

- testing prior to an ISO ILL site starting interoperation with LADD;

¹ www.nla.gov.au/librariesaustralia/laac/documents/laac-paper-2010-2-11-resource-sharing-manifesto.pdf

- testing when an ISO ILL site implements a software upgrade;
- investigation of issues resulting from server failure, different interpretation of the ISO ILL protocol, etc;
- distribution of library directory data to ISO ILL sites;
- maintaining suspensions, and
- convening the annual LADD ISO ILL Partners Meeting.

Alternatives to the ISO ILL protocol

While there are a number of ILL standards, both in development and in production, there is no real alternative to the ISO ILL protocol at this time.

The NISO Circulation Interchange Protocol (NCIP) is a standard which was developed to address the growing need for interoperability among disparate circulation, interlibrary loan and related applications. NCIP supports four application areas, each of which has its own Application Profile. Each Application Profile handles the messages that relate to that function only. One of these, the Circulation/Interlibrary Loan Interaction profile handles the exchange of circulation data between a library's ILL system and its own circulation system.

As it currently stands the NISO Circulation Interchange Protocol (NCIP) is not a suitable standard to replace the ISO ILL protocol for LADD. Libraries Australia does not contain circulation data and does not support links to the circulation modules of local library management systems (LMS). NCIP however would benefit libraries interoperating with the LADD gateway that wish to connect their LMS and ISO ILL systems in order to utilise circulation data in the ILL system. It is possible that future development of NCIP may result in the standard becoming suitable for use as the basis for interoperability with the LADD gateway as a replacement for, or in conjunction with, the ISO ILL protocol.

In their responses to the survey a number of LADD users reported receiving requests for materials that they don't hold due to incorrect holdings in Libraries Australia. This is an issue for the ANBD not specifically LADD. It highlights the need for document supply staff to advocate the benefits of maintaining up-to-date holdings for their library in the ANBD. Users also commented that there is no deep linking to local library catalogues available within LADD to provide up-to-date holding details on the fly. VDX does not currently support deep linking therefore an enhancement would be required to achieve this.

Another ILL standard is the Request Transfer Message (RTM) which was developed by the ILL Protocol Implementors Group (IPIG). RTM is designed to support the transmission of ILL requests from a discovery service (for example OCLC's WorldCat) to ILL systems. RTM is an OpenURL Community Profile and messages contain information about the requester, the desired item and the requested service (e.g. loan, copy or digitization request). RTM has been designed to support a particular service (i.e. transmission of requests from discovery

services to an ILL system) and does not have sufficient scope to be a replacement for the ISO ILL protocol in LADD.

There is a recent trend of library system vendors moving away from standards and towards application programming interfaces (APIs), for example OCLC have implemented two WorldCat search APIs. APIs are used widely in the emerging technology of cloud computing. To date we are not aware of APIs being developed or implemented to support ILL functions. However, given the development of cloud solutions for libraries, this could be a future direction.

Future Plans of Interlibrary Loan System Vendors

OCLC currently provide seven systems that support ILL. Of these all except CBS support the ISO ILL protocol. They have said that identifying a replacement for ISO ILL is a priority and they would work with users and the Rethinking Resource Sharing Initiative to establish their strategy regarding ISO ILL. OCLC have publicly stated that their future services will be based on web scale or cloud computing.

Relais International provides two ILL systems, Relais ILL and D2D (Discovery to Delivery), both of which support the ISO ILL protocol and will both shortly support NCIP. Relais International have said that they will continue to support the standards and protocols that are currently available within their ILL systems as long as there is a core group of their customers using the standard/s.

Ex Libris currently provides two integrated library systems, Voyager and Aleph, which have ILL capabilities and support both the ISO ILL protocol and NCIP version 1. Ex Libris is also currently developing the Alma system, a cloud-based library management service that will support both the ISO ILL protocol and NCIP version 2. This is due to be released in 2012. Regarding the future of ILL standards, Ex Libris stated that they are focussing their efforts on the standards of NCIP and the ISO ILL protocol to support resource sharing.

Future of LADD

Given the significant investment by Australian libraries in standalone ILL systems, the NLA does not envisage a return to a fully centralised national ILL utility. Planning therefore needs to be based on the assumption that standalone sites will want to continue interoperating with the national ILL utility.

Planned and proposed activities

1. The NLA to continue a program of enhancements to the current LADD service giving priority to enhancements identified in the user survey. Continue to work through the VDX Users Group in Australia and New Zealand (VUGANZ) to ensure that high priority enhancements are included in future VDX releases. (See Appendix 2 for a list of enhancement proposals).

2. The NLA to continue to investigate the feasibility of supporting ILL requests from LADD to overseas document suppliers.
3. The NLA to encourage vendors currently interoperating with the LADD system (OCLC, Relais International, ExLibris and Infotrieve) to discuss with each other the best way of ensuring differing interpretations of the ISO ILL protocol are interoperable via ISO ILL within the LADD gateway environment, especially focussing on forthcoming vendor enhancements that could impact upon interoperability between other systems.
4. To emphasise Australian libraries reliance on the ISO ILL protocol, the NLA should provide input for changes to the ISO ILL protocol during the standard's 2013 review process.
5. The NLA, including both the Document Supply Service and Libraries Australia, to be an active participant in the Rethinking Resource Sharing Initiative Interoperability Working Group's investigation of the future of the ISO ILL protocol.
6. The ISO ILL Partners Meeting to be held in conjunction with the 2011 Libraries Australia Forum in Adelaide to focus on the future of the ISO ILL protocol and the directions of ISO ILL sites interoperating with the LADD gateway. The findings of this Report together with developments from the Rethinking Resource Sharing Initiative Interoperability Working Group should form a central part of this meeting. The meeting will assist in opening a dialogue with users on the future of the ISO ILL protocol as well as aiding in the planning of the LADD service.
7. The NLA to investigate the feasibility of deep linking from LADD to the local LMS as a way of addressing the issue of out-of-date holdings.
8. The NLA to continue to monitor and influence the future of the ISO ILL protocol and the development of any replacement with a view to making an early decision regarding the continued operation or replacement of ISO ILL and the VDX software.
9. If necessary, and at the appropriate time, the NLA to consult with LADD users, especially ISO ILL sites, regarding the replacement of the ISO ILL protocol as the standard supporting interoperability with LADD.

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Appendix 1: ILL trends identified in LADD Survey

A. Reasons for increased ILL activity

- Increase in overseas requesting/lending
- Demand to even out but with an increase in hard to source material
- There will be a continuing need as digitisation adds freedoms and restrictions to document access
- The request for obscure/historical information will promote/drive the use of electronic retrieval
- More electronic delivery of articles
- More resource sharing across other states in Australia
- Working in an academic library the trend has been and will likely continue to be a growth in demand for document delivery
- Document delivery to increase as people become time poor and require more service. The trend in ILL activity is currently increasing fairly quickly
- Increase as people are more willing to look further afield for items they want
- Increase in ILL/DD due to libraries being unable to build comprehensive collections

B. Reasons for decreased ILL activity

- Fewer requests for fiction as more becomes available as downloadable electronic versions
- ILL requests will reduce as most employees have access to the internet
- Requests are likely to decrease as more journals become available on full-text databases
- Fewer ILL requests because of the increase in libraries subscribing to electronic journals
- Increased use of electronic resource by libraries resulting in decrease in ILL
- Decreased loan of hard copy books and increase in open access material, with reduction in document delivery requests
- A move to more electronically available information that will ease the use of physical books journeying around
- Copies will be more difficult to source as many libraries don't supply from electronic journals
- Book requesting to decrease due to increase of electronic books

C. E-journals

- Publishers will need to relax their licensing policies for e-resources
- ILL will become more difficult as print subscriptions decline and restrictive licensing means libraries are unable to supply or only able to supply via snail mail
- Will get harder to find a supplier for journals as many are only subscribed to electronically and the licence agreement does not allow ILL
- Unless e-journal licensing is sorted ILL will either become useless or libraries will revert to print subscriptions
- Stricter copyright restrictions requiring more licensing

- Unless copyright law changes it is becoming harder due to licence restrictions for some libraries to provide an article via ILL

D. End users

- End user requesting with no staff intervention
- Independent (direct to user) use of DD/ILL services by the general public (e.g. Deep Linking)
- Patron initiated requesting to any library

E. General trends

- Increase in article requesting and decrease in loans
- Online delivery of electronic books
- Interlending of electronic items i.e. e-books
- Move towards buying books instead of ILL

F. Availability of resources

- Items will cost more through suppliers and publishers
- Article and e-books more available online
- Consortia programs such as BONUS+ will increase
- International cooperation agreements
- Purchasing of articles direct from vendor sites

G. Systems

- More ISO ILL compliant systems
- Live catalogue interrogation rather than the static LA holdings
- Increased application of automated responses in systems
- Cloud systems
- Move away from ISO ILL to consortium arrangements with less monitoring by staff
- Increased use of tablet computing and smartphone/iPhone for ILL/DD

Appendix 2: Suggestions for enhancements to LADD from survey of LADD users

Issue	Solution	Draft Timeframe
LADD gateway to link to other overseas ISO sites.	To be implemented by LA	British Library Document Supply Centre in train and will be implemented in early 2012
Ability to order material from bookshops as part of the requesting process – acquisition rather than ILL.	Possible link to LA Search Get this item Online and At Bookshops/Suppliers through xsl patch	2012/13
A place to report duplicates or errors, similar to 'Fix this Error' in Trove.	Possible link to LA Contact Us page through xsl patch	2012/13
LA Helpdesk details to be displayed at the bottom of each screen.	Possible link to LA Contact Us page through xsl patch	2012/13
Ability to include lending conditions for each library i.e. in the Location screen, similar to suspensions.	Possible VDX enhancement	2013/14
Ability to set up multiple reciprocal agreements at once.	Possible VDX enhancement	2013/14
Customisable interface.	Possible VDX enhancement	2013/14
Include lending library's return address on the request.	Possible VDX enhancement	2013/14
Information links to explain what each section means.	Possible VDX enhancement	2013/14
Libraries to set own preferences for copyright statement used within organisation.	Possible VDX enhancement	2013/14

NB. Implementation of VDX enhancements is subject to the agreement of OCLC.

Appendix 3: Standards and Systems

A. Interlibrary Loan and Document Delivery Standards

Standards	Current Status	Supported Systems	Related Standards	Website
ISO 10160/10161 (ISO ILL)	No longer being developed. Systems in production.	Ex Libris: Aleph. OCLC: ILLiad, VDX, WorldCat. Relais Int: Relais. CLIO: CLIO.	Z39.50	http://www.collectionscanada.gc.ca/iso/ill/standard.htm
NISO Circulation Interchange Protocol (NCIP) : NCIP (ANSI/NISO Z39.83-1)	Version 1 widely in production. Version 2 some implementation. Protocol has committee for review.	Relais Int: Relais, D2D. Polaris ILS. Auto-Graphics: Agent Resource Sharing. OCLC: VDX .	ISO ILL	http://www.ncip.info/about_ncip
ANSI/NISO Z39.88: OpenURL Framework	Widely used in production.	Auto-Graphics: AGent Resource Sharing. CLIO: CLIO. Relais Int: Relais. OCLC: ILLiad, VDX, WorldCat.		http://www.niso.org/standards/z39-88-2004/
Request Transfer Message (RTM)	In production. NISO Z39.88 (Open URL) maintenance agency also serves as the agency for the RTM.	OCLC: VDX, ILLiad, WorldCat.	ISO ILL HTTP/HTTPS OpenURL	

B. Interlibrary Loan and Document Delivery Systems

System Name	Vendor	Australian Implementations	Supported Standards	Comments	Website
Aleph Integrated ILL	Ex Libris	Yes	ISO ILL; Z39.50	Does not support electronic delivery. TCP/IP connection only.	http://www.exlibrisgroup.com/category/Aleph
Content SCM	Infotrieve	Yes	ISO ILL	Support Responding ISO ILL actions only	http://www.infotrieve.com/?q=contentscm
Relais	Relais International	Yes	JEDDS; ISO ILL; OpenURL; Z39.50; NCIP		http://www.relais-intl.com/
Virtual Document eXchange (VDX)	OCLC	Yes	JEDDS; ISO ILL; SIP/NCIP; RTM; OpenURL; Z39.50; LDAP/Kerberos/Shibboleth/Athens	ILL system currently used by LADD.	http://www.oclc.org/au/en/vdx/default.htm
WorldCat Resource Sharing	OCLC	Yes	ISO ILL; Z39.50; OpenURL; RTM		http://www.oclc.org/resources/haring/about/default.htm
AGent Resource Sharing	Auto-Graphics	??	ISO ILL; NCIP		http://www4.auto-graphics.com/
ARTEmail	British Library	No		Requests processed via formatted email	http://www.bl.uk/reshelp/atyourdesk/docsupply/help/order/index.html
CBS	OCLC	No	Z39.50; SRU	Cataloguing system currently used by Libraries Australia, but ILL module not utilised.	http://www.oclc.org/cbs/default.html
Clio System	Clio Software	No	ISO ILL; OpenURL	Also offer ClioBasic that is	http://cli software.com/produ

System Name	Vendor	Australian Implementations	Supported Standards	Comments	Website
				only available to small libraries	ts/cliosystem.htm
D2D	Relais International	No	ISO ILL; NCIP; SIP2		http://www.relais-intl.com/relais/home/index.htm
ILLiad	OCLC	No	ISO ILL; RTM; OpenURL		http://www.oclc.org/illiad/about/default.html
Web-scale Management Services	OCLC	No	ISO ILL; RTM		http://www.oclc.org/au/en/web-scale/default.htm
WorldCat Local	OCLC	??	ISO ILL; RTM		http://www.oclc.org/au/en/worldcatlocal/default.htm

C. Consortia Member Only Systems

System Name	Vendor/Contact	Current Status	Supported Standards	Website
DOCLINE	National Library of Medicine	In production. Membership for medical libraries		http://www.nlm.nih.gov/pubs/factsheets/docline.html
INN-Reach	Innovative Interfaces	In production. In Australia this is the BONUS+ consortium		http://www.iii.com/products/resource_sharing.shtml
RapidILL	Colorado State University Libraries	In production, mainly in America	ISO ILL; XML	http://RapidILL.org
WorldCat Navigator	OCLC	In production throughout the world	GEDI; ISO ILL; NCIP; OpenURL; SIP ; Z39.50	http://www.oclc.org/navigator/about/default.htm

Glossary

JEDDS – for electronic document delivery

ISO ILL – for document requesting

LDAP/Kerberos/Shibboleth/Athens – user authentication

NCIP – circulation system integration

OpenURL – document request and full-text linking

SIP – circulation system integration

Z39.50 – search and retrieval of bibliographic information and document location

XML – encoding documents for display on the Internet